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ORIGINAL RESEARCH

Are Community Pharmacists and Nutritionists capable for Obesity Management in Pakistan? A Cross-sectional Study

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ABSTRACT

The main objective of the study was to evaluate knowledge and perceptions among community pharmacists and nutritionists/ dietitians regarding obesity management in Pakistan.

A semi-structured questionnaire was distributed to a random sample of sample of 277 community pharmacists and 146 nutritionists. The data were collected, computed and analyzed using *SPSS*. Kruskal–Wallis and Mann–Whitney tests ($P \leq 0.05$) were used to compare the knowledge scores of community pharmacists and nutritionists regarding obesity management by profession, length of experience, type of health-care facility, gender, age and city.

Out of 423 respondents, 66.5 % agreed on the availability of guidelines. Most of them considered obesity management guidelines (75.5 %), computer programs/internet (66.6 %) and patient experience (68.7 %) as the most frequently used sources for information regarding obesity management. Orlistat (55.1 %) and metformin (55.7 %) were considered the most effective anti-obesity drugs by most of the respondents. The median score for overall knowledge of community pharmacists and nutritionists regarding standard obesity management guidelines was 33 (range 24-48) and 34 (range 24-48), respectively. No significant differences ($P < 0.05$) were found among the knowledge scores of community pharmacists and nutritionists.

The results of the present study showed adequate knowledge and positive perceptions among community pharmacists and nutritionists regarding management of obesity in Pakistan. The results of the study are quite encouraging and indicate that opportunities exist for involving community pharmacist in weight-management services with other healthcare professionals.

Keywords: Community pharmacists, knowledge, nutritionists, obesity management, perceptions, Pakistan.

Introduction

Obesity is a complicated, multifactorial disease and a growing public health challenge worldwide. The prevalence of obesity has doubled between 1980 and 2014 globally [1]. Obesity is not simply a problem of will power and self-control but it's a complex disorder involving appetite regulation and energy metabolism that is linked with a variety of comorbid conditions [2]. Over-eating, dieting, personal factors and physical inactivity are considered as important risk factors for obesity. A study conducted in USA highlighted that patients were conscious of the obesity associated health risks and agreed that maintaining ideal body weight (IBW) is healthier but most of them were not maintaining their ideal body weight (IBW) [3].

Obesity is a major health problem which requires effective interventions for its prevention and treatment. Evidence

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supports that physical activity when combined with modifications to energy consumption is the most important behavioural approach for preventing obesity [4]. Healthcare professionals need to be adequately trained to manage obesity including assessment of patient attitudes regarding lifestyle modifications and using dietitian and other referrals for weight loss counseling [5]. Pharmacists are well acknowledged as appropriate personal to help people in managing their weight and promoting healthy life style in the developed countries [6, 7]. The idea of engaging community pharmacists and nutritionists in weight management services has been well accepted by the community, as both canhelp to improve behavior and knowledge regarding obesity among obese patients [8-10]. Although, community pharmacy weight management programs have been reported successful in weight management in many developed countries but still need for additional training and educational resources for pharmacy staff has been emphasized for effective pharmacy weight management services [11-13].

Pakistan ranked 9th out of 188 countries in terms of obesity [14, 15]. The social and environmental changes, with a steep rise in urbanization, changing lifestyles, higher energy dense diets and less physical activity are contributing towards the burden of obesity in Pakistan [15, 16]. There are approximately 63,000 community pharmacies in Pakistan. These pharmacies are operated by the proprietary medicine vendors and registered pharmacist licenses. There are three different types of licenses issued to the community pharmacies in Pakistan: type A (license of premises issued to a qualified person having a degree of B-Pharm/Pharm-D i.e. pharmacist), type B (license of premises issued to a qualified person having a diploma in pharmacy i.e. pharmacy assistant) and type C (license of premises issued to a person having a certificate of course completion in drug dispensing i.e. diploma holder) [17]. These pharmacies often lack ample facilities, staffing and equipments. These pharmacies are operated by variety of dispensers such as qualified pharmacist (degree of B- pharm/pharm D), pharmacy assistant (diploma in pharmacy), diploma holder (certified course of drug dispensing), to medical doctors, nurses and to the salespersons (people having no dispensing-related education) and majority represent this group. These salespersons have nominal education of primary or secondary level which is seen as a commercial necessity and not as a legal requirement to be followed. Although, these salespersons working at the pharmacies are not trained, but still, are involved in making diagnoses and recommending therapy to the patients along with dispensing of medicines [18, 19]. Shortage of qualified personnel at community pharmacies who could be engaged for ensuring good pharmacy practices is a common concern in Pakistan. Thus as a result, the dispensers working at these community pharmacies have inappropriate knowledge regarding disease management and dispensing practices at these pharmacies are compromised [19-21].

Patient counseling regarding life style modifications including low calorie diet, increased physical activity and behavioral approach is required for the appropriate management of obesity [2]. Pharmacist is an important and easily accessible member of health care team and must be well equipped with disease specific knowledge, attitudes and skills to support his/her roles [13]. Studies conducted in developing countries have identified that pharmacists are occasionally involved in counseling of obese patients and adequate training of health professionals for appropriate obesity management has been underlined [22-24]. This study will be unique in this aspect as it will be the first ever study conducted in Pakistan to the best of our knowledge which has assessed pharmacist's and nutritionist's knowledge and perceptions regarding obesity management. It will help to identify whether both the health professionals are capable enough to be involved in appropriate management and control of obesity in Pakistan. Thus, the main objective of the study was to evaluate knowledge and perceptions among community pharmacists and nutritionists/dietitians regarding obesity management in Pakistan.

Materials and Methods

Study design

A descriptive, cross-sectional study design was used to evaluate the knowledge and perceptions of nutritionists and community pharmacists regarding obesity management in the 4 major cities of Pakistan: Islamabad (the national capital), Rawalpindi (its twin city), Lahore (Provincial capital of Punjab) and Peshawar (Provincial capital of Khyber Pakhtunkhwa). Approval was obtained for the study from the Ethical Committee of Hamdard University. Moreover, in Pakistan, questionnaire-based studies do not need any Ministry of Health endorsement. Despite that, prior information was sent to the Ministry of Health, Government of Pakistan for the execution of this research among community pharmacists and nutritionists practicing in the four cities. Beside this, approval for the data collection was also taken from the respective District health officers as well as drug inspectors of the respective cities.

Sampling of facilities and respondents

This study was conducted from June to September 2015. The study population included community pharmacists and nutritionist working in the four cities. As there is no list available for the community pharmacists and nutritionists in these four cities, thus lists of community pharmacies and public and private weight management centres in the four cities were obtained. The total population of pharmacies in Islamabad, Rawalpindi and Peshawar were 190, 343 and 174 respectively. The list obtained from Lahore showed a figure of 3000 premises including pharmacies, distributors and whole-sellers, but when discussed with the drug inspectors of Lahore region it was found that the actual number of licensed pharmacies was not more than 1000-1200 in number. The reason being, the list was not updated from many years, it also included closed and or shifted premises and also whole-sellers and distributors as part. Keeping in view these issues the population of pharmacies in Lahore was considered as 1100. Sample size for pharmacies was calculated by using the raosoft sample formula at 95% confidence interval and 5% of margin of error which was 128 for Islamabad, 182 for Rawalpindi, 120 for Peshawar and 133 for Lahore and a total of 563 community pharmacies in the four cities. Simple random sampling technique was used to select the pharmacies. A total of 285 pharmacies were selected out of which only 133 pharmacies selected from the list were visited due to logistical constraints. Only those pharmacies were included in the study which was offering community services including body mass index (BMI) calculation and counselling on weight management. As presence of community pharmacists at these pharmacies has been reported negligible [17-19]. Thus, convenient sampling technique was used to select community pharmacists. The sample size for community pharmacists as per their availability on the date of visit was 55 for Islamabad, 71 for Rawalpindi, 52 for Peshawar and 99 for Lahore which constituted a total sample of 277 community pharmacists in the four cities. On the other hand, as there are few public and private weight management centres in the four cities, thus all the centres were included as sample. There is no national data base of the nutritionists in Pakistan which could tell their exact number in terms of Medicine doctor (MD) or dieticians that's why purposive sampling technique was used to select nutritionists at the known centres. The sample size of nutritionists as per their availability on the date of visit was 45 for Islamabad, 44 for Rawalpindi, 25 for Peshawar and 32 for Lahore and which constituted a total of 146 nutritionists in the four cities. The community pharmacists and nutritionists were contacted on phone and given an explanation of the purpose of the study, and their verbal consent to participate in the study was obtained. None of the respondent refused to participate in the study. Written consent was obtained later on day of filling of questionnaire.

Study tool

A questionnaire was developed on the basis of extensive literature review and using the recent guidelines on obesity management i.e. 2013 AHA/ACC/TOS guidelines for the management of overweight and obesity in adults and 2000NHLBI obesity education iinitiative on the identification, evaluation, and treatment of overweight and obesity in adults, as a reference. Two focus group discussions were carried out at different time intervals with 4 different groups of experts comprised of 3–4 participants including nutritionists, specialists of weight management, community pharmacists and prescribers from academia for the face and content validity of the questionnaire. Pilot testing was carried out on 27 community pharmacists and 14 nutritionists (10%) of the total sample size before beginning the final study. A Cronbach alpha value of 0.85 confirmed the reliability and internal consistency of the questionnaire.

The questionnaire was comprised of 5 sections. The first section included information regarding respondent's demographic characteristics: gender, city, sector (public/private), type of health facility, profession and years of experience. In the second section, opinions of respondents regarding available guidelines and source of information for obesity management were explored. In the third section the knowledge of respondents about obesity indicators, complications, risk factors, diet patterns and caloric requirements were assessed. In the fourth section, knowledge regarding treatment goals, strategies, life-style interventions, pharmaceutical and surgical treatments was assessed. In the last section, the perceptions of respondents regarding prevalence, risk factors and management of obesity was explored. Responses were assigned as 1 = yes/correct and 2 = no/incorrect for section 1 till 4. Knowledge scale was computed on the basis of sub scales. Subscale 1 included 5 questions regarding indicators of body weight assessment (score 5–10). Subscale 2 included 10 questions regarding appropriate caloric requirements and dietary approaches for weight management (score 10-20). Subscale 3 included 9 questions regarding lifestyle intervention program helps in facilitating weight loss and maintenance of lost weight (score 9-18). The composite score range was 24–48 and a lower

score indicated better knowledge. On the other hand, section 5 included a set of statements in which respondents were asked to indicate their level of agreement using a 5-point Likert scale where 1 = strongly disagree, 2 = disagree; 3 = neutral, 4 = agree and 5 = strongly agree was used.

Data collection

Two teams, one in each city, with 10 data collectors in each team, were trained by the group of experts including the principal investigator. The questionnaire was hand-delivered to the respondents by the data collectors. Informed and verbal consent for participation was taken from the respondents. Respondents were assured about the confidentiality of information verbally and were shown an undertaking signed by the principal investigator. The questionnaire was self-completed by the nutritionists and community pharmacists and was collected from them on the same day.

Data analysis

The data were computed and analyzed using *SPSS*, version 16 program and descriptive analysis was conducted. The results of each item in the questionnaire were reported as percentages and frequencies. The Kruskal–Wallis test ($P \leq 0.05$) was used to compare the knowledge scores of nutritionists and community pharmacists regarding obesity management by profession, length of experience and type of health-care facility, and the Mann–Whitney test ($P \leq 0.05$) was used to compare the knowledge of nutritionists and community pharmacists by gender, age and city.

Results

Background characteristics

Of the total pharmacists, 67.6 % were male and 32.4 % were females. While out of the total nutritionists, 40.4% were male and 59.6 % were females. Out of them, 19.2% were working at hospitals, 13.7 % at slimming centers, 8.2% at private clinics and 58.9% were working in academic institutes while all the pharmacists were working at community pharmacies. Of the total respondents, 55.9% pharmacists and 39.7% nutritionists had working experience of less than 1 year, 32.4% pharmacists and 37.6% nutritionists had working experience of 1-5, 8.3% of the pharmacists and 17.8% of the nutritionists had experience of 6-10 years and 3.24% pharmacists and 4.79% nutritionists had working experience greater than 10 years. A detailed description is given (Table 1).

Table 1. Demographic characteristics (n = 423)

Variable	Community Pharmacist n (%)	Nutritionist n (%)	Total n (%)
Gender			
Male	187 (67.6)	59 (40.4)	246 (58.2)
Female	90 (32.4)	87 (59.6)	177 (41.8)
Cities			
Rawalpindi	71 (25.7)	44 (30.1)	115 (27.2)
Islamabad	55 (19.8)	45 (30.9)	100 (23.6)
Peshawar	52 (18.8)	25 (17.1)	77 (18.3)
Lahore	99 (35.7)	32 (21.9)	131 (30.9)
Age			
≤25years	106 (38.2)	24 (16.4)	130 (30.8)
26-35years	123 (44.5)	57 (39.0)	180 (42.6)
36 – 50 years	37 (13.5)	52 (35.7)	89 (21.0)
≥50 years	11 (3.8)	13 (8.9)	24 (5.6)
Type of health facility Community pharmacy	277 (100)	0	277 (65.5)
Hospital	0	28 (19.2)	28 (6.6)
Slimming centres	0	20 (13.7)	20 (4.8)
Private clinics	0	12 (8.2)	12 (2.8)
Academia	0	86 (58.9)	86 (20.3)
Experience (years)			
< 1	155 (55.9)	58 (39.7)	213 (50.4)
1–5	90 (32.5)	55 (37.7)	145(34.2)
6–10	23 (8.4)	26 (17.8)	49 (11.6)
> 10	9 (3.2)	7 (4.8)	16 (3.8)

Opinion of community pharmacists and nutritionists regarding information sources, associated risk factors and FDA approved anti-obesity drugs

Out of the total community pharmacists, 65.7 % of the pharmacists agreed on the availability of guidelines. Most of them considered obesity management guidelines (76.8 %) and computer programs/internet (68.6 %) as the most frequently used sources for information regarding obesity management. They considered coronary heart diseases (84.8 %) and hypertension (78.7 %) as the most important associated risk factor for obesity. Orlistat (62.4 %) and metformin (59.9 %) were considered the most effective anti-obesity drugs by most of the pharmacists. On the other hand, out of the total nutritionists, 67.8 % agreed on the availability of guidelines. Most of them considered obesity management guidelines (72.6 %) and experiences described by patients (70.6 %) as the most frequently used sources for information

regarding obesity management. They considered coronary heart diseases (80.8 %), hypertension (72.6 %) and physical inactivity (72.6 %) as the most important associated risk factor for obesity. Statins (56.8 %) and metformin (47.9 %) were considered the most effective anti-obesity drugs by most of the nutritionists. A detailed description is given (Table 2).

Table 2. Opinion of community pharmacists and nutritionists regarding information sources, associated risk factors and FDA approved effective anti-obesity drugs

Indicator	Pharmacist		Nutritionist		Total		P-value
	Yes n (%)	No n (%)	Yes n (%)	No n (%)	Yes n (%)	No n (%)	
Information sources used for obesity management							
Availability of guidelines	182 (65.7)	95 (34.3)	99 (67.8)	47 (32.2)	281 (66.5)	142 (33.5)	0.66
Medical journals	168 (60.6)	109 (39.4)	85 (58.3)	61 (41.7)	253 (59.8)	170 (40.2)	0.62
Continuing medical education	166 (59.9)	111 (40.1)	87 (59.6)	59 (40.4)	253 (59.8)	170 (40.2)	0.94
Obesity management guidelines	213 (76.8)	64 (23.2)	106 (72.6)	40 (27.4)	319 (75.5)	104 (24.5)	0.33
Computer programs/ internet	190 (68.6)	87 (31.4)	92 (63.1)	54 (36.9)	282 (66.6)	141 (33.4)	0.24
Patients experiences	188 (67.9)	89 (32.1)	103 (70.6)	43 (29.4)	291 (68.7)	132 (31.3)	0.57
Dieticians or endocrinologists	164 (59.2)	113 (40.8)	89 (60.9)	57 (39.1)	253 (59.8)	170 (40.2)	0.72
Mass media	147 (53.1)	130 (46.9)	82 (56.2)	64 (43.8)	229 (54.2)	194 (45.8)	0.54
Associated risk factors for obesity							
Coronary heart disease	235 (84.8)	42 (15.2)	118 (80.8)	28 (19.2)	353 (83.5)	70 (16.5)	0.29
Atherosclerotic diseases	213 (76.8)	64 (23.2)	105 (71.9)	41 (28.1)	318 (75.2)	105 (24.8)	0.28
Type II diabetes	146 (52.7)	131 (47.3)	81 (55.5)	65 (44.5)	227 (53.6)	195 (46.4)	0.58
High blood pressure	218 (78.7)	59 (21.3)	106 (72.6)	40 (27.4)	324 (76.5)	99 (23.5)	0.16
Cholesterol	189 (68.2)	88 (31.8)	83 (56.8)	63 (43.2)	272 (64.4)	151 (35.6)	**0.02**
Physical inactivity	216 (77.9)	61 (22.1)	106 (72.6)	40 (27.4)	233 (55.2)	101 (23.8)	0.21
Family history	201 (72.6)	76 (27.4)	102 (69.8)	44 (30.2)	303 (71.6)	120 (28.4)	0.55
Effective anti-obesity drugs used in Pakistan							
Orlistat	173 (62.4)	104 (37.6)	60 (41.1)	86 (58.9)	233 (55.1)	190 (44.9)	**0.01**
Sibutramine	107 (38.6)	170 (61.4)	55 (37.6)	91 (62.4)	162 (38.3)	261 (61.7)	0.84
Statins	132 (47.6)	145 (52.4)	83 (56.8)	63 (43.2)	215 (50.8)	208 (49.2)	0.07
Metformin	166 (59.9)	111 (40.1)	70 (47.9)	76 (52.1)	236 (55.7)	187 (44.3)	**0.01**

Chi-square test ($p \leq 0.05$)

Knowledge of community pharmacists and nutritionists regarding caloric requirements and dietary approach for weight loss

The correct knowledge regarding different caloric requirements and dietary approaches for weight loss among pharmacists was: 30% or less total kcal from fat (58.2 %), fat and sweet (88.1 %), fruit and vegetables (73.3 %), higher protein diet (41.2 %), low CHO diet (51.3 %) and low-glycemic load diet (58.8 %). On the other hand, the correct knowledge regarding different caloric requirements and dietary approaches for weight loss among nutritionists was: 30% or less total kcal from fat (65.1 %), fat and sweet (86.9 %), fruit and vegetables (86.9 %), higher protein diet (43.8 %), low CHO diet (59.5 %) and low-glycemic load diet (54.7 %). A detailed description is given (Table 3).

Table 3. Knowledge of community pharmacists and nutritionists regarding caloric requirements and dietary approach for weight loss

Indicator	Pharmacist		Nutritionist		Total		P-value
	Correct n (%)	Incorrect n (%)	Correct n (%)	Incorrect n (%)	Correct n (%)	Incorrect n (%)	
30% or less total kcal from fat	161 (58.2)	116 (41.8)	95 (65.1)	51 (34.9)	256 (60.5)	167 (39.5)	0.175
~15% total kcal from protein	121(43.6)	156 (56.4)	76 (52.1)	70 (47.9)	197 (46.5)	226 (53.5)	0.103
≥55% of total kcal from CHO	145 (52.4)	132 (47.6)	94 (64.4)	52 (35.6)	239 (56.5)	184 (43.5)	0.018
Fat and sweet	244 (88.1)	33 (11.9)	127 (86.9)	19 (13.1)	371 (87.7)	52 (12.3)	0.757
Fruit and vegetables	203 (73.3)	74 (26.7)	127 (86.9)	19 (13.01)	330 (78.1)	93 (21.9)	**0.001**
Seafood and yogurt	203 (73.3)	74 (26.7)	119 (81.5)	27 (18.5)	322 (76.2)	101 (23.8)	0.072
Diet of European Association for the Study of Diabetes Guidelines	103 (37.2)	174 (62.8)	56 (38.4)	90 (61.6)	159 (37.5)	264 (62.5)	0.833
Higher protein diet	114 (41.2)	163 (58.8)	64 (43.8)	82 (56.2)	178 (42.1)	245 (57.9)	0.606
Lacto-ovo-vegetarian-style diet with prescribed energy restriction	131 (47.3)	146 (52.7)	69 (47.3)	77 (52.7)	200 (47.3)	223 (52.7)	0.539
Low CHO diet	142 (51.3)	135 (48.7)	87 (59.5)	59 (40.5)	229 (54.2)	194 (45.8)	0.124
Low-fat (10% to 25% of total calories from fat)	192 (69.4)	85 (30.6)	88 (60.3)	58 (39.7)	280 (66.2)	143 (33.8)	0.067
Low-glycemic load diet	163 (58.8)	114 (41.2)	80 (54.7)	66 (45.3)	243 (57.5)	180 (42.5)	0.261
Mediterranean-style diet with prescribed energy restriction	136 (49.1)	141 (50.9)	63 (43.2)	83 (56.8)	199 (47.1)	224 (52.9)	0.469

Chi-square test ($p \leq 0.05$)

Knowledge of community pharmacists and nutritionists regarding desired goals and effective lifestyle intervention program for obesity management

The correct knowledge regarding desired goals and effective lifestyle intervention program for obesity management among pharmacists was: initial weight loss of 10% over six months (49.5 %), 8 kg weight loss in six months (43.4 %), 1-2 lbs weight loss per week (61.4 %), energy deficit of ≥500 kcal/day (62.8 %), brisk walking for ≥150 min per week (64.9 %) and regular self-monitoring of physical activity (77.6 %). On the other hand, the correct knowledge regarding desired goals and effective lifestyle intervention program for obesity management among nutritionists was: initial weight loss of 10% over six months (49.4 %), 8 kg weight loss in six months (45.3 %), 1-2 lbs weight loss per week (57.5 %), energy deficit of ≥500 kcal/day (50 %), brisk walking for ≥150 min per week (65.1 %) and regular self-monitoring of physical activity (67.8 %). A detailed description is given (Table 4).

Table 4. Knowledge of community pharmacists and nutritionists regarding desired goals and effective lifestyle intervention program for obesity management

Indicator	Pharmacist		Nutritionist		Total		P-value
	Correct n (%)	Incorrect n (%)	Correct n (%)	Incorrect n (%)	Correct n (%)	Incorrect n (%)	
Desired goals for obesity management							
Initial weight loss of 10% over six months	137 (49.5)	140 (50.5)	72 (49.4)	74 (50.6)	209 (49.5)	214 (50.5)	0.530
8kg weight loss in six months	120 (43.4)	157 (56.6)	66 (45.3)	80 (54.7)	186 (43.9)	237 (56.1)	0.394
1-2lbs weight loss per week	170 (61.4)	107 (38.6)	84 (57.5)	62 (42.5)	254 (60.1)	169 (39.9)	0.466
>2lbs weight loss per week	157 (56.6)	120 (43.4)	80 (54.7)	66 (45.3)	237 (56.1)	186 (43.9)	0.757
Effective lifestyle intervention program for obesity management							
Energy deficit of ≥500kcal/day	174 (62.8)	103 (37.2)	73 (50)	73 (50)	247 (58.4)	176 (41.6)	0.013
1200-1500kcal/day(F)	173 (62.5)	104 (37.5)	85 (58.3)	61 (41.7)	258 (60.9)	165 (39.1)	0.404
1500-1800kcal/day(M)	160 (57.7)	117 (42.3)	69 (47.3)	77 (52.7)	229 (54.2)	194 (45.8)	0.041
Brisk walking for ≥150min per week	180 (64.9)	97 (35.1)	95 (65.1)	51 (34.9)	275 (65.1)	148 (34.9)	0.688
≥30min per day	183 (66.1)	94 (33.9)	93 (63.6)	53 (36.4)	276 (65.3)	147 (34.7)	0.099
200-300 min per week	165 (59.5)	112 (40.5)	74 (50.6)	72 (49.4)	239 (56.5)	184 (43.5)	0.099
Self-monitoring of food intake	205 (74.1)	7 2(25.9)	107 (73.3)	39 (26.7)	312 (73.7)	111 (26.3)	0.908
Self-monitoring physical activity	215 (77.6)	62 (22.4)	99 (67.8)	47 (32.2)	314 (74.3)	109 (25.7)	**0.035**
Frequent monitoring of weight	207 (74.7)	70 (25.3)	95 (65.1)	51 (34.9)	302 (71.4)	121 (28.6)	**0.042**

Chi-square test ($p \leq 0.05$)

Perceptions of community pharmacists and nutritionists regarding role of pharmacists and nutritionists in obesity management in Pakistan

Out of the total community pharmacists, 49.4 % of the pharmacists considered obesity as a disease. Sixty-one percent of them think that overweight and obese people are able to lose weight and sustain it. Only 7.9 % of them believed that obesity is well managed in Pakistan. More than half of the respondents agreed that pharmacists and nutritionists are capable enough to be involved in management of obesity in Pakistan. Eighty percent of the pharmacists highlighted the need for establishing obesity management centres in Pakistan. On the other hand, out of 146 nutritionists, 67.2 % of the nutritionists considered obesity as a disease. Fifty-seven percent of them think that overweight and obese people are able to lose weight and sustain it. Only 6.8 % of them believed that obesity is well managed in Pakistan. More than half of the respondents agreedthat pharmacistsand nutritionists are capable enough to be involved in management of obesity in Pakistan. Seventy eighty percent of the respondents highlighted the need for establishing obesity management centres in Pakistan. A detailed description is given (Table 5).

Table 5. Perceptions of community pharmacists and nutritionists regarding role of pharmacists and nutritionists in obesity management in Pakistan

Indicators	Pharmacist					Nutritionist				
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
Do you think obesity is a disease?	44 (15.8)	93 (33.5)	26 (9.3)	52 (18.7)	62 (22.3)	42 (28.7)	56 (38.3)	15 (10.2)	18 (12.3)	15 (10.2)
Do you think achieving sustained weight loss can reduce obesity related risk factors?	44 (15.8)	153 (55.2)	48 (17.3)	21 (7.5)	11 (3.9)	30 (20.5)	75 (51.3)	25 (17.1	11 (7.5)	5 (3.4)
Do overweight/obese patients tend to be lazier and more self-indulgent then normal weight person?	29 (10.4)	126 (45.4)	101 (36.4)	15 (5.4)	6 (2.1)	31 (21.2)	67 (45.8)	39 (26.7)	8 (5.4)	1 (0.68)
Do you think overweight and obese people able to lose weight and maintain that loss?	29 (10.4)	140 (50.5)	64 (23.1)	38 (13.7)	6 (2.1)	21 (14.3)	62 (42.4)	41 (28.08)	14 (9.5)	8 (5.4)
Do you think the most effective behavior change programs include two to three in-person meetings a month for at least six months?	24 (8.66)	140 (50.5)	87 (31.4)	23 (8.3)	3 (1.08)	17 (11.6)	65 (44.5)	52 (35.6)	6 (4.1)	6 (4.1)
Do you think questions regarding weight history, dietary habits, physical activities and medications may provide enough information about origin of obesity?	54 (19.4)	151 (54.5)	57 (20.5)	13 (4.6)	2 (0.7)	29 (19.8)	90 (61.6)	18 (12.3)	8 (5.4)	1 (0.68)
Do you think obesity is well managed in Pakistan?	5 (1.8)	17 (6.1)	88 (31.7)	94 (33.9)	73 (26.3)	2 (1.3)	8 (5.4)	46 (31.5)	44 (30.1)	46 (31.5)
Do you think there is need of promoting awareness regarding obesity management among community in Pakistan	58 (20.9)	84 (30.3)	76 (27.4)	19 (6.8)	40 (14.4)	59 (40.4)	50 (34.2)	30 (20.5)	2 (1.3)	5 (3.4)
Do you think pharmacist in Pakistan is capable enough to be involved in management of obesity treatment?	63 (22.7)	103 (37.1)	88 (31.7)	17 (6.1)	6 (2.1)	33 (22.6)	46 (31.5)	48 (32.8)	15 (10.2)	4 (2.7)
Do you think nutritionist in Pakistan is capable enough to be involved in management of obesity treatment?	70 (25.2)	116 (41.8)	77 (27.7)	9 (3.9)	5 (1.8)	47 (32.1)	69 (47.2)	22 (15.06)	3 (2.05)	5 (3.4)
Do you think there is a need of establishing obesity management centre's in Pakistan?	95 (34.2)	127 (45.8)	49 (17.6)	3 (1.08)	3 (1.08)	75 (51.3)	40 (27.3)	30 (20.5)	0	1 (0.68)

Comparison of community pharmacist's and nutritionist's knowledge scores regarding standard obesity management guidelines by demographic characteristics

The composite scores for knowledge were taken into account when assessing the knowledge of community pharmacists and nutritionists regarding standard obesity management guidelines. The median score for overall knowledge of community pharmacists and nutritionists regarding standard obesity management guidelines was 33 (range 24-48) and 34 (range 24-48), respectively. No significant differences ($P < 0.05$) were found among the knowledge scores of community pharmacists and nutritionists between the genders, city, age, different level of experience. No significant differences ($P < 0.05$) were found among the knowledge scores of community pharmacists and nutritionists (Table 6).

Table 6. Comparison of community pharmacists and nutritionists knowledge scores regarding standard obesity management guidelinesby demographic characteristics

Variable	Community Pharmacist				Nutritionists			
	n	Median knowledge score (24-48)	Test Statistics	P-value	n	Median knowledge score (24-48)	Test Statistics	P-value
Gender								
Male	187	33	7472.00[a]	0.130	59	34	2169.5[a]	0.113
Female	90	34			87	33		
Age								
≤ 25years	106	33			24	33		
26-35years	123	34	5.65[b]	0.130	57	34	3.663[b]	0.300
36 – 50 years	37	33			52	33		
≥ 50 years	11	38			13	37		
City								
Rawalpindi	71	34			44	34		
Islamabad	55	33	6.104[b]	0.107	45	35	2.068[b]	0.558
Peshawar	52	32			25	35		
Lahore	99	33			32	32		
Experience (years)								
< 1	155	33			58	33		
1–5	90	33	1.22[b]	0.746	55	33	4.435[b]	0.218
6–10	23	35			26	35		
> 10	9	36			7	38		
Profession								
Community pharmacists	277	33	19920.00[a]	0.801				
Nutritionists	146	34						

a.Mann–Whitney test; b.Kruskal–Wallis test.

Discussion

Weight maintenance requires life-long behavioral change combined with routinely moderate exercise, increased fruit and vegetable and low fat intake, as well as social support. Crash diets and medications are not the answer to long-term weight maintenance [25]. Along with patients, healthcare professionals should also be educated about the benefits of moderate weight loss and effective weight loss approaches [26]. The results of the present study showed that community pharmacists and nutritionists in Pakistan possessed adequate knowledge regarding obesity management. More than half of the community pharmacists as well as nutritionists had correct knowledge regarding different caloric requirements; dietary approaches desired goals and effective lifestyle intervention program for obesity management. However, no significant differences in the knowledge scores were found among both the groups of respondents. The results are in line with other studies reporting better knowledge, skills, and self-efficacy of pharmacists and nutritionist's in using an environmental approach to prevent and manage obesity [27, 28]. Key nutritionist skills identified that influenced weight outcome were meticulous investigation of the underlying obesity cause, identification of the subject's

stage of change, and psychological support. Still need of enhancing knowledge, skills and approach towards behavioral management strategies has been emphasized [27, 28].

The results of the present study showed that more than half of the community pharmacists and nutritionists were familiar with the obesity guidelines and considered obesity management guidelines, internet and patients experiences as the most frequently used sources for information regarding obesity management. The results are in line with the findings of the study conducted in India which reported that more than half of the respondents were not aware of standard treatment guidelines [29].Another study conducted in Baghdad showed internet and obesity management guidelines as the most frequently used sources by the healthcare professionals [30]. The current study revealed that the respondents considered coronary heart diseases, hypertension and physical inability as the most important associated risk factor for obesity. The results are in line with the evidence provided from various prospective studies which highlighted that hypertension in obese patient's increases the risk of causing cardiovascular disease. The extent of the blood pressure response appears to be directly proportional to the amount of weight loss achieved and length of its follow up [31]. The current study reported an interesting finding that Sibutramine was considered as effective anti-obesity drugs by more than half of the respondents. Although, Sibutramine has been voluntarily withdrawn from the U.S. market because of clinical trial data indicating an increased risk of heart attack and stroke but is still been manufactured, available and widely prescribed/ used as an anti-obesity drug in Pakistan. Beside this orlistat, metformin and statins were considered as the most effective anti-obesity drugs by most of the respondents. The findings are in line with other studies reporting orlistat and metformin as effective treatment choices for obesity due to their safe use at present [32, 33].

The results of the present study showed that more than half of the respondents considered obesity as a disease and think that overweight/obese patients tend to be lazier and more self-indulgent then normal weight person. Similar findings were reported from a study conducted in India. The current study also reported that most of the respondents believed that overweight and obese people are not able to lose weight and sustain it. Similar negative views by the healthcare professionals regarding the success of obese patients to lose and maintain the lost weight were reported by a study conducted in Saudi Arabia [24].

Successful obesity management could be achieved by involving a multidisciplinary team of healthcare professionals, which can improve both behavior and knowledge of obese patients [34]. The results of the present study reported that more than half of the community pharmacists and nutritionists were not satisfied with the current management of obesity in Pakistan. Although role of community pharmacists and nutritionists is not well acknowledged at present in the country but most of them believed that they are capable enough to be involved in management of obesity. Several studies reported that respondents appreciated the idea of retrieving weight management services by pharmacists at community pharmacies [6, 10]. On the other hand study conducted in USA had also indicated nutritionists as the most appropriate healthcare professionals for weight management [8]. Successful community pharmacy weight management achieved by both meal replacement (MR) program and a conventional reduced-calorie diet (RCD) in a pharmacy setting has been reported [12]. The results of the present study also highlighted the need of promoting awareness regarding weight management among community and instigation of similar effective weight loss programs for appropriate management of obesity in Pakistan.

Study Limitations

There is no national database in the country and scanty of data which is the reason for not providing exact figure of MD/dieticians. The prevention and treatment of overweight and obese individuals on a population-wide basis is challenging because patients have difficulties with adhering to weight loss programmes. Unfortunately, the present study has not evaluated how these professional figures can promote adherence to the weight reduction program by identifying knowledge on factors predictive of both drop-out rate and weight loss success.

Conclusion

The results of the present study showed adequate knowledge and positive perceptions among community pharmacists and nutritionists regarding management of obesity in Pakistan. The role of the nutritionists should be properly acknowledged in the country. The results of the study are quite encouraging and indicate that opportunities exist for involving community pharmacies in weight-management services, however further research is required to explore awareness, acceptance and expectations of the public's from these services. Beside this qualitative studies can be

designed to investigate factors related to drop-out rate and weight loss success. Thus, based on the findings of the present study, it is recommended that training package for pharmacists promoting a short and prescriptive approach to obesity management through lifestyle modification must be incorporated in their Pharm-D clerkship. Thus, collaborative team work engaging community pharmacists with other health professionals should be encouraged for promoting awareness among community regarding effective management and control of obesity in Pakistan.

Pakistan'da eczane eczacıları ve beslenme uzmanları obezite kontrolü konusunda yetkinliğe sahip midir? Bir Çalışma Kesiti.

ÖZ

Bu çalışmanın temel amacı, Pakistan'da, obezite kontrolü konusunda eczane eczacılarının, beslenme uzmanları ve/veya diyetisyenlerin bilgi birikimlerini değerlendirmektir.

Yarı yapılandırılmış bir anket, rastgele seçilmiş 277 eczane eczacısına ve 146 beslenme uzamanına uygulanmıştır. Toplanan veri bilgisayar ortamında *SPSS* kullanılarak değerlendirilmiştir. Kruskal–Wallis ve Mann–Whitney yöntemleri ($P \leq 0.05$) kullanılarak eczane eczacıları ve beslenme uzmanlarının, obezitenin değerlendirilmesi konusunda bilgi skorları; mesleki bilgileri, tecrübeleri, çalıştıkları sağlık ünitesi, cinsiyetleri, yaşları ve bulundukları şehir dikkate alınarak karşılaştırılmıştır.

423 katılımcının %66.5'i konuyla ilgili kılavuzların mevcudiyeti ve uygunluğu konusunda olumlu görüş bildirmiştir. Katılımcıların birçoğu obezite kontrolü konusunda sıklıkla kullandıkları bilgi kaynaklarının; obezite kontrolü ile ilgili kılavuzlar (%75.5), bilgisayar programları/internet (%66.6) ve hastaların değerlendirilmesi sonucu edinilen tecrübe (%68.7) olduğunu belirtmişlerdir. Katılımcıların büyük çoğunluğu, en etkili antiobezite ilaçlarının orlistat (%55.1) ve metformin (%55.7) olduğunu bildirmişlerdir. Eczane eczacılarının ve beslenme uzmanlarının, obezite kontrolü kılavuzları ile ilgili genel bilgi birikimleri göz önüne alındığında medyan skorları sırasıyla 33 (aralık 24-48) ve 34 (aralık 24-48) olarak hesaplanmıştır. Eczane eczacıları ile beslenme uzmanlarının bilgi skorları karşılaştırıldığında anlamlı bir farklılık bulunamamıştır ($P < 0.05$).

Bu çalışma sonucunda, Pakistan'da obezite kontrolü konusunda eczane eczacıları ile beslenme uzmanlarının yeterli bilgi ve pozitif yaklaşıma sahip oldukları görülmüştür. Çalışmanın sonuçları eczane eczacılarının obezite kontrolü konusunda diğer sağlık profesyonelleri ile birlikte hizmet verebilmesi konusunda oldukça umut vericidir.

Anahtar kelimeler: Eczane eczacıları, bilgi birikimi, beslenme uzmanları, obezite kontrolü, yaklaşım, Pakistan.

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